



Product highlights

- Programmable through integrated USB port
- Sensor calibration for either offset, slope or polynomial adjustment
- Accuracy better than 0.1°C for RTD elements
- Automatic cable compensation calibration (2-wire)
- Fast sampling time < 50 ms
- Galvanic isolated
- IECEx / ATEX pending

Application examples

- Tanks and vessels
- Pipe systems
- Food & Beverage
- Water & Waste water

Technical data

Housing

Style	<ul style="list-style-type: none"> ■ Compact transmitter, Ø44 mm ■ DIN Form B compatible
Overall size	■ Refer to section "Dimensional drawings"
Material	■ Polycarbonate

Power supply

Voltage supply range	■ 7 ... 40 VDC
Reverse polarity protection	■ Yes
Power-up time	<ul style="list-style-type: none"> ■ RTD, Ohm, mV < 3 s ■ T/C < 5 s

Input

Accuracy	■ Refer to section "Measuring range"
Min. measuring span	■ Refer to section "Measuring range"
Cable resistance	<ul style="list-style-type: none"> ■ 2-wire: max. 30 Ω/Cable ■ 3-/4-wire: max. 30 Ω/Cable (T < 700 °C) ■ 3-/4-wire: max. 15 Ω/Cable (T > 700 °C)
CJC compensation	<ul style="list-style-type: none"> ■ Internal: < 0.5 °C ■ External: < 0.2 °C
Sample time	■ < 0.1 s
RTD measuring current	■ < 0.16 mA
Error detection delay	■ < 2 s
Temperature drift (by ambient)	■ Refer to section "Measuring range"
Measuring unit	■ °C, °F or K
Protection	■ ± 35 VDC
Suppression	■ 50 or 60 Hz
Resolution	■ 17 bit
Repeatability	■ Refer to section "Measuring range"
Offset adjustment	■ ± 500 °C

Output

Output signal	<ul style="list-style-type: none"> ■ 4 ... 20 mA ■ 20 ... 4 mA
Characteristics	■ Linear or customised with max. 30 points

Output

Accuracy	■ < ± 0.025 % of output span
Shunt resistance	■ $R_s \leq (V_s - 7 \text{ V}) / 0.023 \text{ A } [\Omega]$
Up/Down scaling limits	■ 23 mA / 3.5 mA
Damping	■ 0 ... 60 s
Response time T90	■ 450 ms
Resolution	■ 14 bit
Effect of variations in supply voltage	■ < 0.001 % / V
Temperature drift (by ambient)	■ < ± 0.01 % / °C change
Ripple immunity	■ < ± 1 % of output span

Ambient conditions

Operating temperature range	■ -40 ... 85 °C
Storage temperature range	■ -50 ... 85 °C
Humidity	■ < 98 % RH, condensing
Degree of protection (EN 60529)	■ IP55

Compliance and approvals

EMC	<ul style="list-style-type: none"> ■ EN 61326-1:2013 (Class A, Industrial) ■ DNVGL-CG-0339:2015 (Class A) ■ Namur NE21:2012 (1) ■ EN 50121-3-2:2016
-----	---

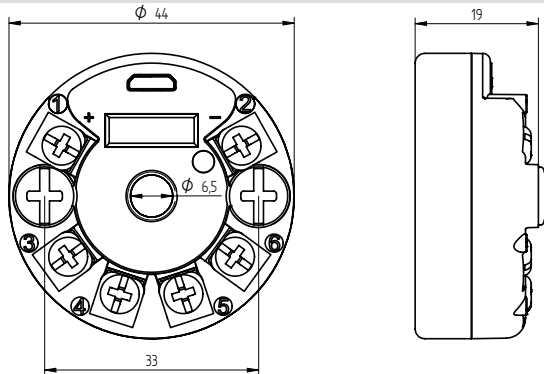
Explosion protection	<ul style="list-style-type: none"> ■ ATEX (pending) ■ IECEx (pending)
----------------------	---

Factory settings

Type	■ Pt100
Unit	■ °C
Measuring span	■ 0.0 ... 100.0
Connection	■ 2-wire
Cable resistance	■ 0 Ω
Damping	■ 0 s
Sensor break detection	■ 23 mA

(1) Voltage interruptions: 15 ms

Dimensional drawings



Description

The FlexTop 2212 is a 4...20 mA loop-powered, configurable universal transmitter with galvanic isolation between input and output. The input can be configured for RTD or T/C sensors, resistance, current or voltage signals.

Either 2-, 3- or 4-wire connection can be selected for the resistance input. The built-in temperature sensor or an external RTD element can be used to compensate for „cold junction“ (CJC) if thermo-couples are connected.

The configuration is done with the FlexProgram, and the connection can be established using an USB cable directly

mounted between the FlexTop and a PC.

The FlexTop 2212 is embedded in silicone which makes it resistant to humid environments. It is ready for direct display mounting through UnitCom cable. Furthermore it has a 6.5 mm center hole for fast sensor replacement and spring loaded mounting screws which ensures a safe fastening even in vibrating environments.

Measuring range

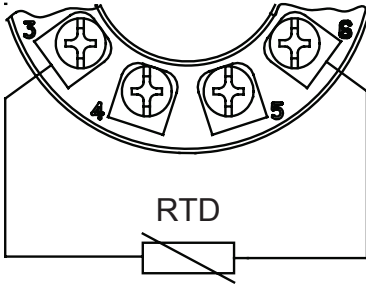
Type	Standard	Measuring range	Min. measuring span	Type	Range	Repeatability	Input accuracy	Input temperature drift (by ambient)
Pt25 ... Pt1000	DIN/EN/IEC 60751	-200 ... 850 °C	10 °C	Pt100-Pt200	-200 ... 200 °C	≤ ± 0.03 °C	≤ ± 0.05 °C	≤ ± 0.01 °C/°C change
					200 ... 850 °C		≤ ± 0.06 °C	≤ ± 0.015 °C/°C change
				Pt500	-200 ... 200 °C	≤ ± 0.07 °C	≤ ± 0.14 °C	≤ ± 0.04 °C/°C change
					200 ... 850 °C	≤ ± 0.09 °C	≤ ± 0.18 °C	≤ ± 0.05 °C/°C change
				Pt1000	-200 ... 200 °C	≤ ± 0.04 °C	≤ ± 0.07 °C	≤ ± 0.02 °C/°C change
					200 ... 850 °C		≤ ± 0.09 °C	≤ ± 0.025 °C/°C change
Pt25 ... Pt1000	a= 0.003902	-150 ... 650 °C	10 °C	Pt100-Pt200	-150 ... 650 °C	≤ ± 0.03 °C	≤ ± 0.05 °C	≤ ± 0.013 °C/°C change
					Pt500		-150 ... 200 °C	≤ ± 0.07 °C
				Pt500	200 ... 650 °C	≤ ± 0.08 °C	≤ ± 0.16 °C	≤ ± 0.044 °C/°C change
					Pt1000	-150 ... 200 °C	≤ ± 0.04 °C	≤ ± 0.07 °C
				Pt1000	200 ... 650 °C	≤ ± 0.08 °C		≤ ± 0.022 °C/°C change
				Pt25 ... Pt1000	a= 0.003916	-200 ... 720 °C	10 °C	Pt100-Pt200
200 ... 720 °C	≤ ± 0.05 °C	≤ ± 0.013 °C/°C change						
Pt500	-200 ... 200 °C	≤ ± 0.07 °C	≤ ± 0.14 °C					≤ ± 0.04 °C/°C change
	200 ... 720 °C	≤ ± 0.08 °C	≤ ± 0.16 °C					≤ ± 0.045 °C/°C change
Pt1000	-200 ... 200 °C	≤ ± 0.04 °C	≤ ± 0.07 °C					≤ ± 0.019 °C/°C change
	200 ... 720 °C		≤ ± 0.08 °C					≤ ± 0.022 °C/°C change
Pt25 ... Pt1000	a= 0.003920	-200 ... 660 °C	10 °C	Pt100-Pt200	-200 ... 200 °C	≤ ± 0.03 °C	≤ ± 0.05 °C	≤ ± 0.01 °C/°C change
					200 ... 660 °C		≤ ± 0.06 °C	≤ ± 0.013 °C/°C change
				Pt500	-200 ... 200 °C	≤ ± 0.07 °C	≤ ± 0.14 °C	≤ ± 0.04 °C/°C change
					200 ... 660 °C	≤ ± 0.08 °C	≤ ± 0.16 °C	≤ ± 0.045 °C/°C change
				Pt1000	-200 ... 200 °C	≤ ± 0.04 °C	≤ ± 0.07 °C	≤ ± 0.019 °C/°C change
					200 ... 660 °C		≤ ± 0.08 °C	≤ ± 0.022 °C/°C change

Measuring range

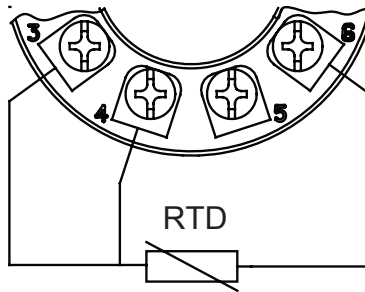
Type	Standard	Measuring range	Min. measuring span	Type	Range	Repeatability	Input accuracy	Input temperature drift (by ambient)
Ni25 ... Ni1000	DIN 43760	-60 ... 250 °C	10 °C	Ni100-Ni200	-60 ... 100 °C	≤ ± 0.03 °C	≤ ± 0.05 °C	≤ ± 0.01 °C/°C change
					100 ... 250 °C		≤ ± 0.04 °C	≤ ± 0.006 °C/°C change
				Ni500	-60 ... 100 °C	≤ ± 0.06 °C	≤ ± 0.11 °C	≤ ± 0.03 °C/°C change
					100 ... 250 °C	≤ ± 0.04 °C	≤ ± 0.08 °C	≤ ± 0.02 °C/°C change
Ni1000	-60 ... 100 °C	≤ ± 0.03 °C	≤ ± 0.06 °C	≤ ± 0.015 °C/°C change				
	100 ... 250 °C	≤ ± 0.02 °C	≤ ± 0.04 °C	≤ ± 0.01 °C/°C change				
Cu25 ... Cu1000	0.428 Ohm/°C	-50 ... 200 °C	10 °C	Cu50	-50 ... 200 °C	≤ ± 0.04 °C	≤ ± 0.08 °C	≤ ± 0.02 °C/°C change
				Cu100-Cu200	-50 ... 200 °C	≤ ± 0.02 °C	≤ ± 0.04 °C	≤ ± 0.01 °C/°C change
B(PtRh30-Pt)	IEC 584	100 ... 1820 °C	200 °C		100 ... 500 °C	≤ ± 5 °C	≤ ± 10 °C	≤ ± 3.3 °C/°C change
					500 ... 1000 °C	≤ ± 1 °C	≤ ± 2.0 °C	≤ ± 0.6 °C/°C change
					1000 ... 1820 °C	≤ ± 0.6 °C	≤ ± 1.1 °C	≤ ± 0.33 °C/°C change
E(NiCr-CuNi)	IEC 584	-250 ... 1000 °C	50 °C		-250 ... -40 °C	≤ ± 0.5 °C	≤ ± 1.03 °C	≤ ± 0.3 °C/°C change
					-40 ... 150 °C	≤ ± 0.1 °C	≤ ± 0.19 °C	≤ ± 0.06 °C/°C change
					150 ... 1000 °C	≤ ± 0.07 °C	≤ ± 0.14 °C	≤ ± 0.042 °C/°C change
J(Fe-CuNi)	IEC 584	-210 ... 1200 °C	50 °C		-210 ... -40 °C	≤ ± 0.25 °C	≤ ± 0.52 °C	≤ ± 0.16 °C/°C change
					-40 ... 150 °C	≤ ± 0.1 °C	≤ ± 0.21 °C	≤ ± 0.07 °C/°C change
					150 ... 1200 °C	≤ ± 0.09 °C	≤ ± 0.18 °C	≤ ± 0.055 °C/°C change
K(NiCr-Ni)	IEC 584	-250 ... 1370 °C	100 °C		-250 ... -40 °C	≤ ± 1 °C	≤ ± 2.04 °C	≤ ± 0.6 °C/°C change
					-40 ... 150 °C	≤ ± 0.15 °C	≤ ± 0.27 °C	≤ ± 0.08 °C/°C change
					150 ... 1370 °C	≤ ± 0.13 °C	≤ ± 0.25 °C	≤ ± 0.075 °C/°C change
L(Fe-CuNi)	DIN 43710	-200 ... 900 °C	50 °C		-200 ... 50 °C	≤ ± 0.17 °C	≤ ± 0.33 °C	≤ ± 0.1 °C/°C change
					50 ... 620 °C	≤ ± 0.1 °C	≤ ± 0.20 °C	≤ ± 0.06 °C/°C change
					620 ... 900 °C	≤ ± 0.09 °C	≤ ± 0.17 °C	≤ ± 0.05 °C/°C change
N(NiCrSi-NiSi)	IEC 584	-250 ... 1300 °C	50 °C		-250 ... -40 °C	≤ ± 1.75 °C	≤ ± 3.45 °C	≤ ± 1.0 °C/°C change
					-40 ... 500 °C	≤ ± 0.2 °C	≤ ± 0.40 °C	≤ ± 0.12 °C/°C change
					500 ... 1300 °C	≤ ± 0.13 °C	≤ ± 0.26 °C	≤ ± 0.08 °C/°C change
R(PtRh13-Pt)	IEC 584	-50 ... 1750 °C	100 °C		-50 ... 100 °C	≤ ± 1.35 °C	≤ ± 2.7 °C	≤ ± 0.8 °C/°C change
					100 ... 500 °C	≤ ± 0.7 °C	≤ ± 1.33 °C	≤ ± 0.4 °C/°C change
					500 ... 1750 °C	≤ ± 0.45 °C	≤ ± 0.9 °C	≤ ± 0.28 °C/°C change
S(PtRh10-Pt)	IEC 584	-50 ... 1760 °C	100 °C		-50 ... 100 °C	≤ ± 1.3 °C	≤ ± 2.5 °C	≤ ± 0.75 °C/°C change
					100 ... 500 °C	≤ ± 0.7 °C	≤ ± 1.37 °C	≤ ± 0.41 °C/°C change
					500 ... 1760 °C	≤ ± 0.5 °C	≤ ± 1.01 °C	≤ ± 0.3 °C/°C change
T(Cu-CuNi)	IEC 584	-250 ... 400 °C	50 °C		-250 ... -40 °C	≤ ± 0.8 °C	≤ ± 1.6 °C	≤ ± 0.5 °C/°C change
					-40 ... 100 °C	≤ ± 0.15 °C	≤ ± 0.29 °C	≤ ± 0.09 °C/°C change
					100 ... 400 °C	≤ ± 0.1 °C	≤ ± 0.21 °C	≤ ± 0.065 °C/°C change
U(Cu-CuNi)	DIN 43710	-200 ... 600 °C	50 °C		-200 ... 50 °C	≤ ± 0.25 °C	≤ ± 0.5 °C	≤ ± 0.15 °C/°C change
					50 ... 300 °C	≤ ± 0.13 °C	≤ ± 0.25 °C	≤ ± 0.08 °C/°C change
					300 ... 600 °C	≤ ± 0.09 °C	≤ ± 0.17 °C	≤ ± 0.05 °C/°C change
W5-Re (Type C)	ASTM 988	0 ... 2310 °C	100 °C		0...1750 °C	≤ ± 0.4 °C	≤ ± 0.75 °C	≤ ± 0.22 °C/°C change
					1750...2310 °C	≤ ± 0.55 °C	≤ ± 1.09 °C	≤ ± 0.22 °C/°C change
W3-Re (Type D)	ASTM 988	0 ... 2300 °C	100 °C		0...400 °C	≤ ± 0.5 °C	≤ ± 1 °C	≤ ± 0.3 °C/°C change
					400...1200 °C	≤ ± 0.26 °C	≤ ± 0.52 °C	≤ ± 0.16 °C/°C change
					1200...2300 °C	≤ ± 0.5 °C	≤ ± 1 °C	≤ ± 0.3 °C/°C change
Linear voltage			5 mV		-140...140 mV	≤ ± 0.005 mV	≤ ± 10 µV	≤ ± 0.007 mV/°C change
Linear voltage			75 mV		-500...2000 mV	≤ ± 0.1 mV	≤ ± 125 µV	≤ ± 0.04 mV/°C change
Linear resistance			5 Ω		0...390 Ω	≤ ± 0.007 Ω	≤ ± 15 mΩ	≤ ± 0.004 Ω/°C change
Linear resistance			5 Ω		0...820 Ω	≤ ± 0.015 Ω	≤ ± 30 mΩ	≤ ± 0.007 Ω/°C change
Linear resistance			50 Ω		0...7000 Ω	≤ ± 0.15 Ω	≤ ± 250 mΩ	≤ ± 0.07 Ω/°C change

Electrical connection

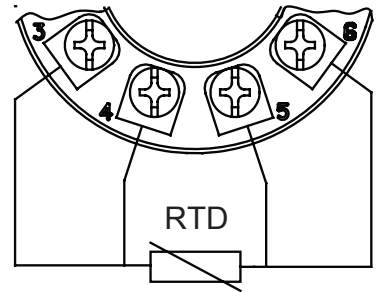
RTD



No cable compensation

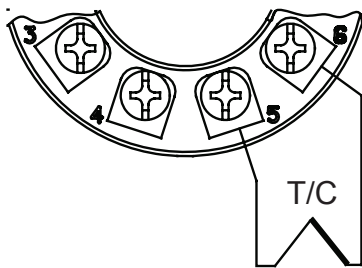


3-wire cable compensation

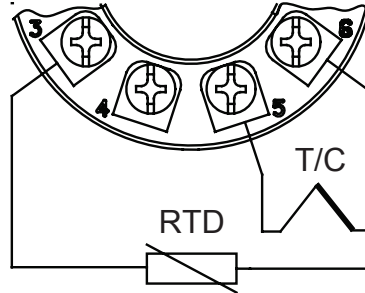


4-wire cable compensation

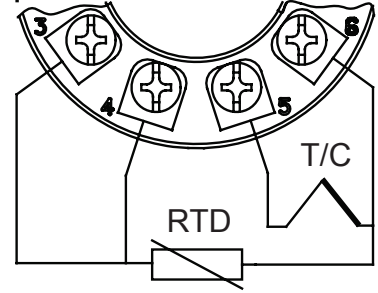
T/C



Internal CJC-compensation

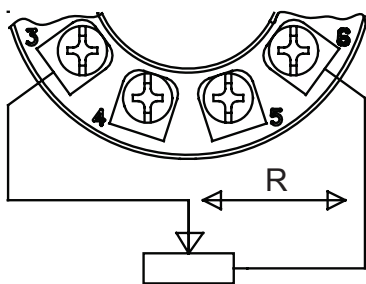


External CJC-compensation, no cable compensation

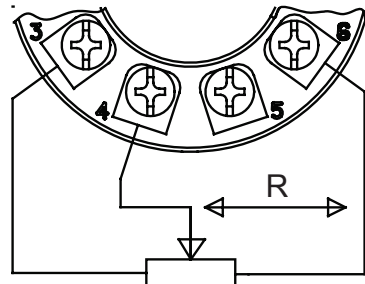


External CJC-compensation, 3-wire cable compensation

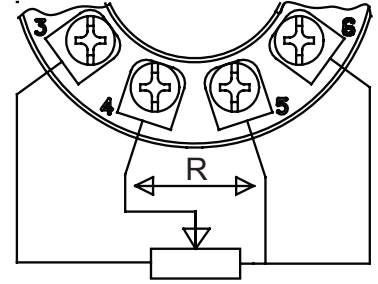
Potentiometer



No compensation



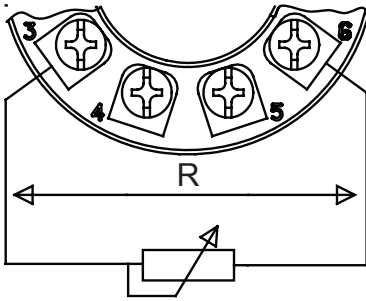
3-wire compensation for transfer resistance



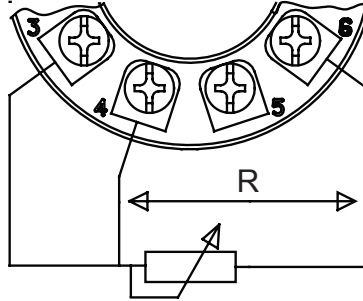
4-wire compensation for transfer resistance

Electrical connection

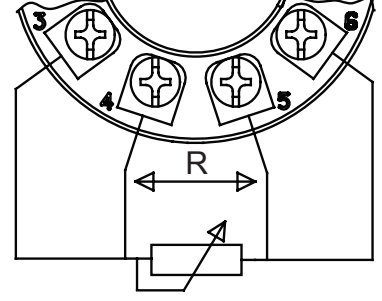
Resistance



No compensation

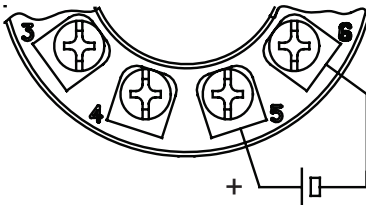


3-wire cable compensation

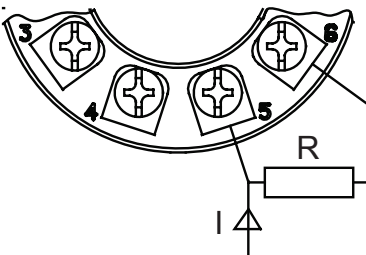


4-wire cable compensation

Voltage measurement



Current measurement



Ordering information

Ordering Key

	2212	-	000	x	·	x
Product line						
Universal temperature transmitter	2212					
Type						
Standard						1
Configuration						
Without						0
Configuration of range						C